

Snapping ulnar nerve at the elbow: A case report and review of the literature

Snapping ulnar nerve

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Abstract

Case: A 15-year-old girl presented with complaints of pain and feeling of a snapping on the medial side of her left elbow. No pathology was detected on X-Ray, Magnetic Resonance Imaging, and nerve conduction evaluations. Then, the dynamic Ultrasound showed that the ulnar nerve has snapped. We performed surgery to treat the ulnar nerve that was transposed under the fascia of the muscle. The medial head of the triceps muscle was elevated and moved laterally. All of her symptoms were resolved.

A snapping ulnar nerve is often associated with a snapping triceps. Accurate diagnosis is critical because misdiagnosis has been demonstrated to have serious consequences, including the need for repeat surgery.

Keywords

Snapping Ulna; Snapping Elbow; Cubital Tunnel; Triceps Syndrome; Transposition

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Introduction

Isolated ulnar nerve instability is not common. The sensation of snapping around the elbow is not only related to the instability of the ulnar nerve but may also be because of the snapping of the medial head of the triceps muscle over the medial epicondyle. This may be accompanied by symptoms of the ulnar nerve. It is named ‘Snapping Triceps Syndrome,’ which occurs when the triceps is subluxated or dislocated on the medial epicondyle [1]. Because of recurring events in the ulnar nerve, instability during elbow flexion and extension is felt like a snap. Repeated trauma leads to ulnar neuritis. We treated the patient who had complaints of elbow sensation of snapping for two years. The patient was informed that data concerning the case would be submitted for publication, and she provided consent.

Case Report

A 15-year-old girl, a student, presented with complaints of pain and a snapping feeling on the medial side of the left elbow. She has been symptomatic for two years; her symptoms mainly consisted of inconvenience and intense pain around the medial humeral epicondyle during daily routine flexion and extension. During the last four months, symptoms had become worse. On careful physical examination, the snapping of the ulnar nerve over the medial epicondyle at 70° of flexion was suspected (Figures1, 2). Ulnar nerve function was intact, with no irritability and no abnormality on the neurophysiologic investigation. Tenderness over the medial humeral epicondyle was noted, and a possible diagnosis of medial epicondylitis was considered, but the picture was not typical. Investigations, including plain X-rays, Magnetic Resonance Imaging (MRI), and nerve conduction studies were normal. Then, the dynamic ultrasound (D-USG) showed that the ulnar nerve has snapped.

The treatment offered was conservative (bracing and nonsteroidal anti-inflammatory drugs [NSAIDs]) for three weeks. Informed consent was taken from her parents. Three weeks later, her exam was repeated, but her complaints did not regress, and surgery was performed. Intraoperatively, her ulnar nerve was observed to be dislocated and accompanied by the medial head of the triceps. There was no hypoplasia or other bone deformities at the medial epicondyle. The ulnar nerve was released proximally and distally. The ulnar nerve was transposed from its natural location posterior to the medial epicondyle to an anterior site, under the fascia of the flexor carpi ulnaris (FCU) muscle. The medial head of the triceps muscle was elevated and moved laterally. The intraoperative examination revealed that the pathology disappeared (Figure 3). An upper elbow brace was used for three weeks that kept the elbow at 90° of flexion, and a rehabilitation program lasted for six more weeks. There were no postoperative complications, and the patient had no symptom for one year.

Discussion

Recurrent ulnar nerve dislocation is not a common problem. Dislocation usually occurs in the dominant extremity. Its etiology is independent of a certain age, cause, and profession [2]. Considering the etiology of snapping ulnar syndrome, triceps muscle hypertrophy, laxity in congenital stabilizer ligaments, posttraumatic medial epicondyle bone anomaly and hypoplasia

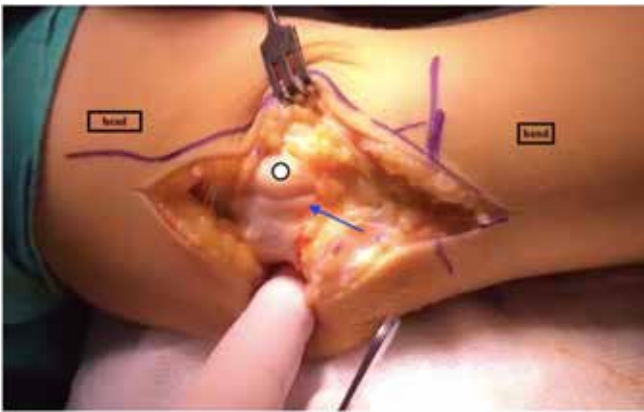


Figure 1. Ulnar nerve (blue arrow) is observed in its groove when the left elbow extended. Medial epicondyle (black circle) is pointed.



Figure 2. The ulnar nerve (black arrow) snaps to the anterior aspect of the medial epicondyle (blue circle) when the elbow is flexed

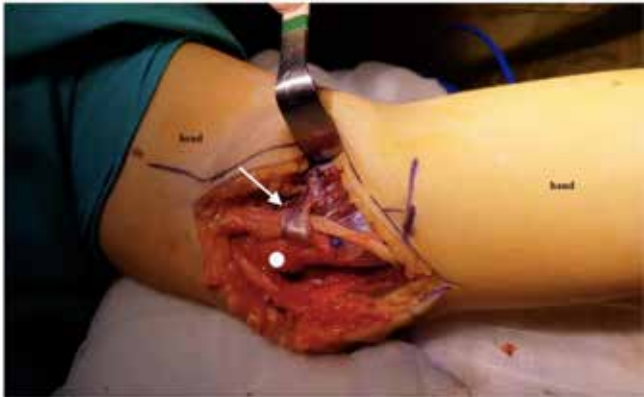


Figure 3. The ulnar nerve is transposed in the anterior muscle (White arrow), medial epicondyle (White circle).

may be present. Anatomic variations of muscle have also been reported in cases accompanied by snapping of the triceps muscle [2-4].

When our patient was examined, the ulnar nerve was subluxated or dislocated on the medial epicondyle with flexion of the elbow of 70° and above, and returns to normal upon elbow extension. The sensation of snapping on the medial elbow is not only related to the ulnar nerve. Coexistence of the snapping of the medial head of the triceps muscle frequently may occur and should be vigilant on examination [2,3]. Symptoms are not only because of the dislocation of the ulnar nerve but may

Table 1. Reports of snapping ulnar nerve in the literature (Demographics, history, exam, diagnostic procedure, treatment, outcome)

	Year	Case Numbers	Accompanying pathology	Age/Sex/ Job	History	Examination	Diagnostic procedure	Conservative treatment	Surgical Treatment	Outcome
Rolfsen L. (9)	1970	One	Snapping triceps, ulnar neuritis	21/M/Car-penter	NR	Snapping struc-ture+	Clinical exam	NR	AT	Snapping sensation persisted and reoper-ated
Haws et al. (8)	1995	One	Snapping triceps	45/M/ Welder	6 m	Snapping struc-ture+	On exam	Ultrasonography Cortisone injec-tion	ASMT	After 4 m persisted and reoper-ated
Spinner et al.(6)	2000	Fifteen	Snapping triceps	13M, 2F average age: 30 (17-50)/ NR	NR	Snapping struc-ture+ 13/15) ulnar neuropathy	10/15) Physical exam 3/15) surgical exploration 2/15) axial flexion MRI	NR	10/15) ASCT 5/15) ASMT	4/15) Persistent snapping
Jacobson et al. (5)	2001	Three	1,2,3) Snapping tri-ceps, ulnar neuritis	52/F/NR 34/F/NR 17/F/NR	1)NR 2) NR 3) NR	1,2,3) Snapping structure+	1,2,3) Dynamic USG: +	1,2,3) NR	1,2) NR 3) she had operated	1,2) NR 3) Relocat-ing
Xarchas et al. (3)	2007	Three	1,2) Isolated 3) Cubital tunnel syndrome	33/M/Body builder 28/F/Wait-ress 35/F/Secre-tary	1.5 y 1 y NR	1,2,3) Snapping structure+	1,2) X-ray: N USG: N EMG: N Clinical exam 3) Clinical exam, EMG:+	1,2)Strapping, NS All 3) NR	1) ASMT 2) denied surgery 3) ASCT	1) 6 m/good 2) NR 3) 3 w
Watts et al. (7)	2009	Three	1,2,3) Snapping triceps	35/M/Engi-neer 30/M/Site manager 12/M/Rugby player	NR 9 y 12 m	1,3) Snapping structure+ 2) Snapping structure+, ulnar neuropathy 2)	1,2,3) Clinical exam Neurophysiologic investigation: N	NR NR NR	ASMT AT ASMT	1) After 6 w persisted and reoper-ated 2) after 2 w persisted and reoper-ated 3) good
Anand et al. (13)	2012	One	Isolated	17/M/de-cathlete	3 y	Snapping struc-ture +	X-ray: N MRI: N EMG: N Diagnosis: Surgery	Rest NSAI physiotherapy	Bilateral ASMT	3 m/ good
Gupta et al. (15)	2012	One	Snapping triceps	35/M/La-borer	6 m	Snapping struc-ture, ulnar neuroplasty	X-ray: N USG: N Dynamic USG: +	Analgesic regime	AT	6 m/good
Molnar et al. (16)	2012	One	Isolated	17/NR/Elite wrestler	1 w after trauma	Snapping struc-ture+	Dynamic USG: +	NR	Partial epicon-dylectomy	6 w/good
Lasecki et al. (11)	2014	One	Snapping triceps	28/NR/Ten-nis player	NR	Snapping struc-ture+	X-ray: N USG: N MRI: enlarged ulnar nerve Dynamic USG: +	NR	NR	NR
Cesmebasi et al. (17)	2015	Three	1,3) Snapping triceps, Snapping medial antebrachial cuta-neous nerve (MACN) 2) MACN	9/M/student 32/F/NR 17/F/softball catcher	15 m 36 m 36 m	1) Snapping structure + 2) Snapping structure + 3) Snapping structure +	1) X-ray: N MRI: N USG: + EMG: Not Reported(NR) 2) X-ray: N MRI: N EMG: N Physical exam: + 3) X-ray: N MRI: N USG: + EMG: N	1)No 2)No 3)No	1) ASCT 2) Triceps release 3) ASCT	1) 3 y/ good 2) 4 m/ good 3) 8 m / good
Chuang et al. (10)	2016	One	Snapping triceps	32/M/NR	3 m	Snapping struc-ture+	Static USG: Negative Dynamic USG: +	NS All Upper elbow Splint	The patient declined	NR
Kontogeorgakos et al. (18)	2016	One	Cubitus varus	12/F/NR	NR	Snapping struc-ture+	NR	NR	ASCT	Partial relief of her symptoms
Overall		N = 35 case		Average, 29 (range, 9-52)						

NR: Not reported, AT: anterior transposition, ASCT: Anterior subcutaneous transposition, ASMT: Anterior submuscular transposition

present with findings of ulnar neuritis. Therefore, the findings of dislocation developed again in patients who were operated on with the diagnosis of isolated false cubital tunnel syndrome and necessitated reoperation [3,5-8].

Surgical procedures to resolve compression of a nerve are not enough to solve the problem. In the subsequent process, recurrence occurs as complaints, such as numbness, tingling, or prickling in the area of the ulnar nerve track.

The most important diagnostic method is a physical examination. The isolated snapping ulnar nerve or the accompanying snapping of the medial head of the triceps muscle (if there is no anatomical variation) may be palpated. Imaging methods leading to a diagnosis indicate that the event is a dynamic process (Table 1). Typically, the patient's medical history and physical exam are adequate for making the diagnosis [2,7,9]. X-ray images are usually normal if there is no previous trauma or congenital osseous anomaly. MRI is stable, single position does not reveal any additional findings. An MRI in the flexion position shows that the ulnar nerve has come out of its groove [3]. D-USG shows the snapping ulnar nerve and triceps muscle during elbow movements [5,10,11,12]. In cases with ulnar neuropathy, nerve conduction studies and electromyography (EMG) help determine nerve damage but are not useful in identifying the underlying etiology [13].

Patients with mild pain, without recurrent snapping and not much discomfort in daily life, may receive conservative treatment (NSAIDs, posterior elbow splints, rest, physical therapy). Non-surgical treatments reduce symptoms but do not eliminate the underlying snapping [2,8,10,14]. If there are recurrent snapping and ulnar neuropathy, surgical treatment should be considered. The surgical procedure usually involves ulnar nerve dissection from the proximal and distal along the track and transposition to the anterior medial epicondyle. Depending on the preference of the surgeon, the ulnar nerve can be transferred to submuscular or subcutaneous fixation. Submuscular fixation makes surgery safer [2]. We applied anterior transposition of the ulnar nerve and submuscular fixation in our case. The accompanying medial triceps muscle was also excised. Anterior transposition is sufficient in isolated ulnar nerve lesions. Surgical procedures such as excision of the triceps medial head, lateral lubrication of the triceps and partial medial epicondylectomy can be added if there snapping of the triceps is accompanied [3,9,15-18]. Inadequate intraoperative evaluation results in repeated surgeries. We think that the transposition of the ulnar nerve should be accompanied by the release or excision of the medial head of the triceps regardless of whether the triceps muscle is accompanied or not. In previous case reports, after isolated ulnar nerve procedures, snapping had continued, and secondary surgery was performed for the snapping triceps muscle [3,5,7,8,9].

Conclusion

A snapping ulnar nerve is extremely rare and an associated snapping triceps tendon should always be suspected. The dynamic nature of this syndrome necessitates the careful selection of imaging modalities. We think that the primary diagnostic method is D-USG. Surgical treatment is the final method for both definitive diagnosis and definitive treatment. Since a snapping ulnar nerve is frequently associated with a

snapping triceps, both should be intervened during surgery. Otherwise, repeated surgeries may be required.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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